T·D

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/806,695	03/23/2004	Carlos Francisco Fuente	GB920030036US1	3375

29683 7590 06/15/2006

HARRINGTON & SMITH, LLP
4 RESEARCH DRIVE
SHELTON, CT 06484-6212

EXAMINER	
PORTKA, GARY J	

ART UNIT	PAPER NUMBER
2188	

DATE MAILED: 06/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/806,695	FUENTE ET AL.	
	Examiner	Art Unit	
	Gary J. Portka	2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) *13-15,27 and 28* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-11,16-21,24-26,29-33,35 and 36* is/are rejected.

7)☒ Claim(s) *7,12,22,23 and 34* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/23/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

   I. Claims 1-12, 16-26, and 29-36 are drawn to a copy engine and method with a control register with a count of the copy space, a direction indication, and an increment/decrement indication, classified in class 712, subclass 225.

   II. Claims 13-15 and 27-28, drawn to a copy engine and method with a locking mechanism, serialization mechanism, where a write of zeros executes with no effect if unlocked and is retried if locked until the previous copy operation completes, classified in class 712, subclass 225.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination I has separate utility such as a copy engine having a control register with count of copy space needed, direction of copy indication, and indication of increment or decrement, without regard to a locking mechanism where a write of zeros executes with no effect if unlocked, and is retried if locked until the previous copy operation completes. See MPEP § 806.05(d).

3. Because these inventions are independent or distinct for the reasons given above and the inventions require a different field of search (see MPEP § 808.02), restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Harry Smith on May 2, 2006 a provisional election was made without traverse to prosecute the invention of Group 1, claims 1-12, 16-26, and 29-36. Affirmation of this election must be made by applicant in replying to this Office action. Claims 13-15 and 27-28 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Priority

6. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

7. The information disclosure statement (IDS) submitted on March 23, 2004 was considered by the examiner.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 29, 32, and 33 are rejected under 35 U.S.C. 102(e) as being anticipated by Hori et al., US 2003/017729 A1, or alternatively by Fujita et al., US 6,760,789 B2.

10. As to claim 29, Hori discloses *instructions causing a computer agent* (CPU 10) *to issue write operations to store in a copy engine* (DMAC 100, see Abstract, Figs. 2-3, and para. 0012 and 0025-0026) *external to the agent, a count value in a control register* (16) *indicating amount of data to be copied, first and second addresses in respective first and second registers* (12 and 14), *where storing a non-zero count value locks the registers from receiving a write operation from another computer agent* (locks to the extent claimed since the device must perform a transfer indicated by the registers to perform correctly, at least until the transfer is complete, see para. 0052), *and where storing the second address initiates execution of a copy operation* (since the operation starts after the registers are set, and may be considered starting when they are set).

11. As to claim 29, Fujita discloses *instructions causing a computer agent* (CPU 13) *to issue write operations to store in a copy engine* (17) *external to the agent, a count value in a control register* (17d and 17i, see col. 5 lines 49-56) *indicating amount of data to be copied, first and second addresses in respective first and second registers* (17b and 17c, see col. 5 lines 42-49), *where storing a non-zero count value locks the registers from receiving a write operation from another computer agent* (locks to the

extent claimed since storing a value in registers 17f and 17h prevents interruption, and may be considered part of the count value, see col. 5 line 66 to col. 6 line 12), *and where storing the second address initiates execution of a copy operation* (since the operation starts after the registers are set, and may be considered initiating when they are set).

12. As to claims 32-33, values indicating the addresses are incremented or decremented are disclosed in Hori (18, see also para. 0032) and Fujita (17e, see col. 5 lines 57-65).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. Claims 1-4, 8-11, 16-19, 24, 26, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hori, in view of Kosuge et al., US 4,719,563, or alternatively over Fujita in view of Kosuge.

15. As to claims 1, 11, 16, 31, Hori discloses a computer containing and method using a copy engine (DMAC 100, see Abstract, Figs. 2-3, and para. 0012 and 0025-0026) comprising first register (14) to point to a first address, second register (12) to point to a second address, one address a source and one a destination, a control register comprising a count of the memory space required by a copy operation (16), and an indication of whether the first address is incremented or decremented (18, see also

para. 0032). Hori does not disclose an indication of the direction as being from the first to the second or the second to the first address.

16. As to claims 1, 11, 16, 31, Fujita discloses a computer containing and method using a copy engine (DMA controller 17, see col. 5 lines 22-25) comprising first register (17c) to point to a first address, second register (17b) to point to a second address, one address a source and one a destination (see col. 5 lines 42-49), a control register comprising a count of the memory space required by a copy operation (17d and 17i, see col. 5 lines 49-56), and an indication of whether the first address is incremented or decremented (17e, see col. 5 lines 57-65). Fujita does not disclose an indication of the direction as being from the first to the second or the second to the first address.

17. Kosuge discloses a data transfer mechanism analogous to the two transfer mechanisms described in Hori and Fujita above. In Kosuge a direction command set into a register provides versatility in that the direction of transfer between a first and a second indicated location may be specified (see col. 2 lines 42-48, col. 3 line 40 to col. 4 line 7). The direction of transfer may be indicated implicitly by designating a particular register as source and destination, or by providing a designation of which register is source and which is destination. An artisan would have recognized the trade-off in that the latter method requires an added direction specifying indication, but improves the versatility by allowing the direction between register addresses to be controlled. Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use an indication of the direction between the register addresses, because this was a known means of improving the versatility of such a device as taught by Kosuge.

18. As to claims 2-3 and 17-18, Hori and Fujita disclose locking mechanism by a write to the control register, to the extent claimed, since in each case the operation controlled by current register settings must complete without changing them or possible errors could occur. Also, Hori includes a situation where a reload function is not used, data transfer must be performed before change the addresses (see para. 0052), and Fujita describes a suppression of interruption function (see col. 5 line 66 to col. 6 line 12, and col. 6 lines 44-55), both of these equivalent to a locking mechanism.

19. As to claims 4 and 19, since the point at which the copy operation is triggered may be variously defined, to the extent claimed the copy operation is triggered by the write to the address register in Hori and Fujita as recited.

20. Claims 5-6 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hori, in view of Kosuge, and further in view of Buch, US 5,669,002, or alternatively over Fujita, in view of Kosuge, and further in view of Buch.

21. As to claims 5-6 and 20-21, neither Hori nor Fujita disclose the attempt to write is retried if register is locked or active. However, it was well known that any resource locked or active could elicit a couple of responses, either (as described by Buch at col. 4 lines 10-21) the requester could retry, or go on to other tasks. Clearly the requester must retry if it eventually needs to be able to access the resource. Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to retry the register if locked, because this was a known method of dealing with a locked resource to eventually satisfy a request for access.

22. As to claims 8-9 and 24, a plurality of register sets as recited is obvious in view of Hori and Fujita, as clearly such a design can be scaled by adding more registers, or more processors having these registers, or more systems having these processors with registers.

23. As to claim 10, in Hori and Fujita the area beyond the registers to the extent claimed may be considered any storage outside the registers used to transfer cache lines from the processor.

24. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hori, in view of Estakhri et al., US 5,606,660, or alternatively over Fujita in view of Estakhri.

25. As to claim 25, neither Hori nor Fujita disclose that the copy engine is disposed between the memory and firmware. However, it was known to use such a copy control mechanism between memory and firmware, see Estakhri, Figs. 4-5 and col. 3 lines 17-24, which describe a transfer of firmware code to memory, clearly to allow the code to operate faster from the faster RAM. Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use the copy engine between firmware and memory, because it was known to use a copy engine to transfer firmware code to memory, to improve execution performance.

26. As to claim 26, Hori and Fujita disclose firmware that allocates free space and initializing to point to free space, since any system upon initial start up includes free space that may be used to copy data.

27. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hori, in view of Tye, US 6,055,365, or alternatively over Fujita in view of Tye.

28. As to claim 30, neither Hori nor Fujita disclose a byte swap value for enabling a byte swapping operation. However, such a tool for use in data transfer was well known in the art, see Tye col. 8 table and col. 12 lines 7-14. Byte swapping is a commonly used function in data transfer, and a byte swap value facilitates the control of this function. Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use a byte swap value to enable byte swap, because this was a known means to implement such a well known function.

29. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hori, in view of Sporer et al., US 6,584,152 B2, or alternatively over Fujita in view of Sporer.

30. As to claim 35, neither Hori nor Fujita disclose that the addresses are 4-byte aligned. However, such aligning was commonly used in the art and is taught in Sporer, see col. 12 lines 26-29. Such alignment simplifies the addressing because offsets into a line, etc. do not need to be considered. Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to 4-byte align the addresses, because this was a common means to simplify the addressing scheme.

31. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hori, in view of Moyer, US 6,775,727 B2, or alternatively over Fujita in view of Moyer.

32. As to claim 36, neither Hori nor Fujita disclose the write operations issued in a burst from the internal cache. However, such write bursts from cache were well known and commonly used in the art. Moyer describes various cache burst consideration, which include write bursts from the cache (see col. 1 lines 30-35, col. 3 lines 28-31, col. 6 lines 4-9 and 25-29), such bursting improves performance because it minimizes stalls

and improves the efficiency of the bus. Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to burst write operations from a cache, because this was a known means to improve performance and efficiency.

Allowable Subject Matter

33. Claims 7, 12, 22-23, and 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

34. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary J. Portka whose telephone number is (571) 272-4211. The examiner can normally be reached on M-F 9:30 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on (571) 272-4210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Gary J Portka
Primary Examiner
Art Unit 2188

June 12, 2006

Gary J Portka

GARY PORTKA
PRIMARY EXAMINER